

WHAT IS CLAIMED IS:

1. An audio processor which processes an input data stream via an external memory device, comprising:

5 a control device connected to the external memory device which stores programs and data streams used for sequentially executing a plurality of processes, the control device being configured to fetch in, when executing one of the processes, a program and data stream corresponding to next one of the processes from  
10 the external memory device;

an internal memory connected to the control device and configured to store the program and data stream read from the external memory device and corresponding to the one and next one of the processes; and

15 a data processor connected to the internal memory and configured to subject the input data stream to the process based on the program and data stream read from the internal memory.

2. An audio processor according to claim 1,  
20 wherein the input data stream includes an audio data stream, and the data processor sequentially subjects the audio data stream to decoding, noise-less decoding, noise reduction, filter bank, and block switching in accordance with the programs and data streams read from  
25 the external memory device in units of one process.

3. An audio processor according to claim 2, wherein the data processor is configured to execute the

program fetched in the internal memory from the external memory device in accordance with progress of the processes.

4. An audio processor according to claim 1, which includes a system processor which separates the input data stream into a video stream and an audio stream, and writes the video and audio streams into different and independent memory regions of the external memory device, respectively.

5. An audio processor according to claim 4, wherein the data processor is configured to subject the audio stream to signal processing according to the program.

6. An audio processor according to claim 5, wherein the internal memory comprises an instruction memory configured to store an instruction group of the program transferred from the external memory device and a data memory configured to store a data group transferred from the external memory device, and the data processor performs the process based on the instruction group using the data in the data memory and data corresponding to a progress stage of audio data reconstruction to generate audio data.

7. An audio processor according to claim 6, which includes a DMA controller configured to control writing of data to the external memory device, the instruction memory and the data memory, and reading of the data

therefrom by a direct access memory transfer.

8. An audio processor according to claim 5,  
wherein the control device sequentially transfers a  
plurality of program modules corresponding to the  
5 plurality of processes to the data processor from the  
external memory device according to the progress of the  
processes.

9. An audio processor according to claim 5,  
wherein the data processor executes decoding of bit  
10 stream data, noiseless decoding, inverse quantization,  
scale factor, TNS processing, filter bank processing,  
and the block switching, in this order, to reconstruct  
audio data.

10. An audio processor according to claim 9,  
15 wherein the data processor includes a function of  
predicting which process is performed after the process  
which is currently performed.

11. An audio processor according to claim 7,  
wherein the internal memory stores a program module  
20 which request the DMA controller for preparing, while  
continuing the processing which is currently performed,  
the data group and instruction group that are required  
for the next process.

12. An audio processor according to claim 11,  
25 wherein a DMA transfer instruction is added to the  
program module in order to read the program module used  
in the next process from the external memory device,

the DMA transfer instruction allowing to read the program module with the DMA transfer by specifying the storage area.

13. An audio processor according to claim 5,  
5 wherein the processor allows data which is determined to be unused for a long time to be saved from the internal memory to the external memory device.

14. An audio processor according to claim 13,  
10 wherein the processor releases the storage region of the data or the program which becomes unnecessary.

15. A data processing apparatus for processing an input data stream via an external memory device comprising:

15 a control device configured to fetch in programs for encoding and decoding, input/output data, work data, table data which are stored in the external memory device;

20 a data processor configured to perform data processing for coding or decoding according to the programs fetched by the control device;

a data memory configured to store the data fetched by the control device;

an instruction memory configured to store the programs to be applied to the processor; and

25 a DMA controller configured to transfer the data among the instruction memory and the data memory and the external memory,

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the data processor controlling the DMA controller to perform the encoding and the decoding, read program and data required for the next process from the external memory, and write data obtained by the process into the external memory device.

16. An audio processor according to claim 15, wherein the data processor temporally stops when accessing of the DMA controller to the instruction memory or the data memory competes with accessing of the data processor to the instruction memory or the data memory.

17. An audio data processing method for processing an input data stream, comprising:

preparing an external memory device which stores programs and data streams used for sequentially executing a plurality of processes,

fetching in, when executing one of the processes, a program and data stream corresponding to next one of the processes from the external memory device;

storing the program and data stream read from the external memory device and corresponding to the one and next one of the processes in a memory; and

subjecting the input data stream to the process based on the program and data stream read from the internal memory.

18. A method according to claim 17, wherein the input data stream includes an audio data stream, and

the subjecting step sequentially subjects the audio data stream to decoding, noise-less decoding, noise reduction, filter bank, and block switching in accordance with the programs and data streams read from the external memory device in units of one process.

19. An audio data processing method for sequentially subjecting input data to a plurality of processes, comprising:

storing a plurality of program modules corresponding to the plurality of processes and data to be processed in an external memory;

reading, when executing one process, a program module and data to be processed which are used for a next process from the external memory; and

processing the readout data in accordance with the readout program module.